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CLAIMS

1. An exercise trainer to provide exercise movement to a user comprising:

a first crank arm and a second crank arm oriented at an angular distance from the other;

a first foot link connected to said first crank arm and a second foot link connected to said second crank arm;

foot pedals supported on said foot links for relative movement with respect to said foot links;

a bearing support for said foot links at a point removed from said first and second crank arms to which said first and second foot links are supported for sliding reciprocating movement;

a connection between a grounded point and said foot pedals interconnected with said foot links to provide relative movement as to the ground of said foot pedals at least twice the length of each respective crank arm; and,

a seat mounted on said trainer to provide for a user sitting on said trainer and placing the user's feet

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1                   on said foot pedals for exercise movement.

2.                 The exercise trainer as claimed in Claim 1 further  
3                   comprising:

4                   said connection is of a length to provide a movement  
5                   of said foot pedals in the outline of a modified  
6                   ellipse.

7                 The exercise trainer as claimed in Claim 1 further  
8                   comprising:

9                   said connection provides movement of said foot pedals  
10                  of at least twice the crank length upon 90° of  
11                  movement of the crank arm and at least four times the  
12                  distance upon 180° of movement of the crank arm.

13                 The exercise trainer as claimed in Claim 1 wherein:

14                   said connection comprises a flexible member connected  
15                  to said foot link by one or more pulleys around which  
16                  said flexible member is placed at a point removed  
17                  from the foot pedal.

18                 The exercise trainer as claimed in Claim 1 further  
19                   comprising:

20                   said first and second crank arms being connected to a

motor for driving said crank arms at a given speed.

6. The exercise trainer as claimed in Claim 5 further comprising:

a controller which limits the speed of said motor to provide a load beyond said speed to the crank arms and connected foot pedals.

7. The exercise trainer as claimed in Claim 5 further comprising

a motor and control for raising and lowering said seat with respect to said foot pedals.

8. An exercise trainer with a leg movement multiplier and a seat comprising:

a base;

first and second crank arms rotationally supported  
angularly apart on said base:

first and second foot links connected respectively to said first and second crank arms at one end and supported for sliding movement distally from said crank arms:

1                   first and second foot pedals respectively supported  
2                   for longitudinal movement on said first and second  
3                   foot links;

4  
5                   a connection between said foot pedals and a ground  
6                   connection on said base and interconnected with said  
7                   foot links so that said foot links when moved in  
8                   supported relationship with said crank arms provide  
9                   for a degenerated elliptical movement of said foot  
10                  pedals with respect to ground greater than twice the  
11                  length of its respective crank arm; and,

12  
13                  a seat mounted on said base having a height  
14                  adjustment with respect to the foot pedals.

15  
16                 9. The exercise trainer as claimed in Claim 8 further  
17                 comprising:

18  
19                 said connection being a flexible member supported on  
20                 a pulley to the rearward of said foot pedal and a  
21                 pulley forward of said foot pedal.

22  
23                 10. The exercise trainer as claimed in Claim 8 wherein:

24  
25                 said crank arms are connected to a motor for  
26                 providing rotational movement of said crank arms.

27  
28                 11. The exercise trainer as claimed in Claim 10 further

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1 comprising:

2 a motor controller for controlling the speed of said  
3 motor for positive drive of said pedals and  
4 alternatively providing a load on said pedals.

5  
6 12. An exercise trainer comprising:  
7

8 a base;

9  
10 a first and second crank arm angularly apart from  
11 each other mounted on said base;

12  
13 a motor connected to said crank arms for driving said  
14 crank arms;

15  
16 first and second foot links respectively connected to  
17 said first and second crank arms;

18  
19 a bearing surface mounted on said base removed from  
20 said connection of said foot links to said crank arms  
21 providing reciprocal movement of said foot links;

22  
23 a foot pedal mounted on each of said foot links  
24 having a bearing surface which engages said foot  
25 links for reciprocal movement with respect to said  
26 foot links;  
27

1 a linkage between said foot pedals and said foot  
2 links;

3  
4 a securement for securing said linkage to a fixed  
5 portion on said base to provide relative movement of  
6 said foot pedals with respect to ground greater than  
7 twice the length of a crank arm, and in a degenerated  
8 elliptical path; and,

9  
10 a seat mounted for movement by a motor up and down  
11 with respect to said foot pedals in order to raise  
12 and lower a user with respect to said foot pedals.

13. 14. The exercise trainer as claimed in Claim 12 further  
comprising:

15  
16 said mechanical linkage comprising a flexible member  
17 connected to said foot pedal and to said foot link;  
18 and,

19  
20 a controller for controlling the speed of said motor  
21 connected to said crank arms and the elevation of  
22 said seat.

23  
24. 25. The exercise trainer as claimed in Claim 12 further  
comprising:

26  
27 a rotational mounting for said seat for causing said

1 seat to turn on its mounting toward the side of said  
2 trainer.

3  
4 15. An exercise trainer comprising:

5 a first and second foot link connected and supported  
6 for opposing reciprocal movement;

7  
8 a support for said foot links providing a bearing  
9 surface for reciprocal movement and support so as to  
10 allow said foot links to reciprocate;

11  
12 a first foot pedal mounted on said first foot link  
13 and a second foot pedal mounted on said second foot  
14 link;

15  
16 a connecting member connected between said foot link  
17 and said foot pedal;

18  
19 a ground connection connected to said connecting  
20 member to assist movement of said foot pedals on said  
21 foot link in a modified elliptical path;

22  
23 a seat mounted on said exerciser for raised and  
24 lowered placement with respect to said pedals; and,

25  
26 a motor for driving said foot pedals.

27  
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1       16. The exercise trainer as claimed in Claim 15 further  
2 comprising:

3                     4 a controller for controlling the movement of said  
4                     5 motor to provide a drive or a retarding movement of  
5                     6 said foot pedals with respect to a user's movements.

7       17. The exercise trainer as claimed in Claim 15 further  
8 comprising:

9                     10 a motor connected to said seat having a linkage to  
10                  11 raise and lower said seat; and,

11                     12 a controller for controlling said motor to raise and  
12                  13 lower said seat to a desired height.

13       18. The exercise trainer as claimed in Claim 15 further  
14 comprising:

15                     16 a controller which sets the speed of said motor to  
16                  17 provide a given speed of said pedals under positive  
17                  18 drive and a retarding force when a user exceeds the  
18                  19 given speed.

20       19. An exercise trainer having a seat comprising:

21                     22 a first and second crank arm having a common axis  
22                  23 supported on a frame with a base, said first and

1 second crank arm being angularly displaced from each  
2 other;

3  
4 a first foot link and a second foot link respectively  
5 supported on said first crank arm and said second  
6 crank arm;

7  
8 a support for supporting said foot links removed from  
9 said first and second crank arm supports for  
10 reciprocal movement as said cranks are turned;

11  
12 a first foot pedal on said first foot link and a  
13 second foot pedal on said second foot link supported  
14 for reciprocal movement on said foot link;

15  
16 a linkage between said foot pedal and said foot link  
17 and a fixed portion of said frame to provide  
18 reciprocal movement of said foot pedals through a  
19 degenerated ellipse having its major axis greater  
20 than the length of the crank arm to which it is  
21 supported;

22  
23 a seat mounted on said exercise trainer having an  
24 adjustable seat mounting for moving said seat as to  
25 its distance with respect to said first and second  
26 foot pedals; and,

27  
28 a motor connected to said seat for adjusting the

distance of said seat with respect to said pedals.

20. The exercise trainer as claimed in Claim 19 further comprising:

said linkage being formed as a flexible member wrapped at either end around a pulley and connected to said foot link.

21. The exercise trainer as claimed in Claim 20 further comprising:

a controller for controlling the height of said seat.

22. The exercise trainer as claimed in Claim 19 further comprising:

a motor connected to said crank arms; and,

a controller for controlling the speed of said motor.

23. The exercise trainer as claimed in Claim 22 further comprising:

said controller having a control for controlling the speed of said motor at a setpoint to supplement or retard movement by a user.

- 1       24. An exercise trainer having a seat comprising:
- 2
- 3       a first crank arm and a second crank arm angularly  
4       offset from each other connected to a motor for  
5       rotational movement;
- 6
- 7       a first foot link connected to said first crank arm  
8       and a second foot link connected to said second crank  
9       arm;
- 10
- 11      a first foot receiving member and a second foot  
12      receiving member respectively connected for movement  
13      on said first foot link and said second foot link;
- 14
- 15      a linkage between said first foot link and said foot  
16      receiving member interconnecting them, a linkage  
17      between said second foot link and said foot receiving  
18      member, both of said linkages connected to a ground  
19      point so that said foot links when reciprocated cause  
20      said foot receiving members to reciprocally move on  
21      said foot links in relative displacement with respect  
22      to said ground; and,
- 23
- 24      a controller for controlling the speed of said motor  
25      and the attendant speed of said crank arms.
- 26
- 27       25. The exerciser as claimed in Claim 24 further  
28      comprising:

1       said controller having a circuit for setting the  
2       speed of said motor at a given speed of movement for  
3       a user, and which can retard the movement of a user  
4       above a set speed and supplements the movement of a  
5       user below the set speed.

6  
7       26. The exercise trainer as claimed in Claim 25 wherein:

8  
9       the controls for said motor and the seat height are  
10      on a panel of said exerciser.

11      27. The exercise trainer as claimed in Claim 26 wherein:

12  
13      said seat is mounted for pivoting on its axis to the  
14      side of said trainer.